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Fir tussock moth
SURVEYS
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DOUGLAS-FIR TUSSOCK MOTH OUTBREAK IN NORTHEASTERN WASHINGTON

SEASON OF 1955

By T. T. Terrell, Entomologist

Prepared By The
Forest Insect Laboratory
Missoula, Montana

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Summary of Current Infestation

An infestation of the Douglas-fir tussock moth (Hemerocampa pseudotsugatae McD.) in northeastern Washington developed into a serious outbreak in 1955. During the period of September 6 through September 22 an aerial survey was made of the infested Douglas-fir forests by the Missoula Forest Insect Laboratory to determine the extent of the damage. The areas of heaviest infestation were found to be in Stevens County with small scattered spots of infestation in Spokane and Pend Oreille Counties (table 1). Altogether, 87 separate areas of infestation varying from single infested trees to as much as 2,000 acres of tree defoliation were mapped during the flights (figure 1). From all appearances this infestation has increased in size alarmingly during the past year.

Table 1.--Douglas-fir tussock moth infestations in northeastern Washington, 1955

County	Estimated infested acreage	Remarks
Stevens	9,063	75 areas of from 1 to 2,000 acres
Spokane	10	10 spots in farm yards
Pend Oreille	2	2 spots in farm yards
	9,075	

Ownership of the infested timber is thought to be mostly State and private; the Federal Bureau of Land Management may have jurisdiction over some Public Domain land in these areas.

History

Douglas-fir tussock moth infestations in northeastern Washington are not new; during the late 1920's a moth outbreak on the Colville National Forest destroyed an estimated 300 million board feet of timber.

The current infestation has been moderately active for several years. It was first reported by Soil Conservation Service and Washington State Division of Forestry personnel and more recently by Colville National Forest personnel. From 1950 through 1954 the Forest Insect Laboratory[1/] continued to receive additional reports of minor infestations. Field examinations by the Laboratory showed that the insect activities were confined to trees around farm homes and woodlots. However, late in June 1955, while making a periodic on-the-ground check of known moth infestations, the insects were found to have spread over larger areas of timber in the vicinity of Colville, Washington.[2/]

An aerial survey was immediately planned as the only practical means of mapping areas of infestation. The actual survey was delayed until early September due to the press of other work. A part of the area was surveyed on September 6 and 7, but the survey was temporarily suspended at that time when drifting smoke from Coast forest fires reduced tree visibility to the point where survey progress was too slow to be practical. The survey was resumed again on September 19 and completed on September 22.

Survey Methods

The methods used on the Douglas-fir tussock moth survey in 1955 were similar to those used by the Laboratory for other defoliating insects. Where terrain permitted, a close gridiron coverage was made by spacing flight lines at from 1 to 4 mile intervals depending on visibility. Much of the area covered was farm land or low rolling hills bordering the cultivated valleys; a gridiron survey design was, therefore, practical for most of the survey. Where higher ridges and hills prevented a gridiron coverage, flight lines were made on a contour basis. When possible, the flights were made at right angles to the

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1/ Formerly of the ex-Bureau of Entomology and Plant Quarantine.
2/ GIBSON, ARCHIE L. and TERRELL, TOM T. Preliminary report of Douglas-fir tussock moth infestations in northeastern Washington. United States Department of Agriculture, Forest Service, Intermountain Forest & Range Experiment Station, Ogden, Utah. August 19, 1955. (Mimeographed).

sun because by this method the best visibility of tree damage was obtained. Observation was usually made from the right side of the airplane with the light source at the observer's back. Visibility in the direction away from the light was approximately twice that toward the light.

Heights flown varied with the terrain and visibility, but they were usually within a range of from 300 to 800 feet above the ground. Occasionally, a lower flight was necessary for accurate damage delineation over some farm yards where livestock-damaged trees had the appearance of moth defoliation.

Evidence of tussock moth damage would undoubtedly have been more easily seen from the air during August when the reddened, partially chewed needles may have been present. In many instances where the infestation appeared to be quite light, denuded twigs in the upper branches often constituted the only indication of insect activity. Because of this condition, the evidence of infestation in some of the larger areas was very difficult to see.

A total of 26 hours and 50 minutes flying time was required for the survey which covered approximately 2,465,000 acres.

Equipment

The aircraft used for the survey was a Curtiss-Wright Air Sedan under Forest Service fire control contract from the Johnson Flying Service at Missoula, Montana. The plane was powered by a 330 horsepower Wright engine equipped with a blower, making the full horsepower available up to 20,000 feet altitude. This particular airplane has been modified for forest observational work. A high-lift wing and high pitch propeller setting gives it great climbing ability and a slower flying speed. Indicated air speed, while observing insect damage, was usually 70 miles per hour; corrected for altitude, this would be about 85 miles per hour actual speed at higher elevations.

As an aid to the observer a pair of medium density amber colored glasses was found very helpful. With these glasses defoliated trees in the lighter infestations could be detected at approximately twice the distance that they could with the unaided eye.

Personnel

Personnel engaged in the survey were: J. Edwin Morse, principal observer; T. T. Terrell, part-time observer and trainer; and Penn Stohr, pilot.

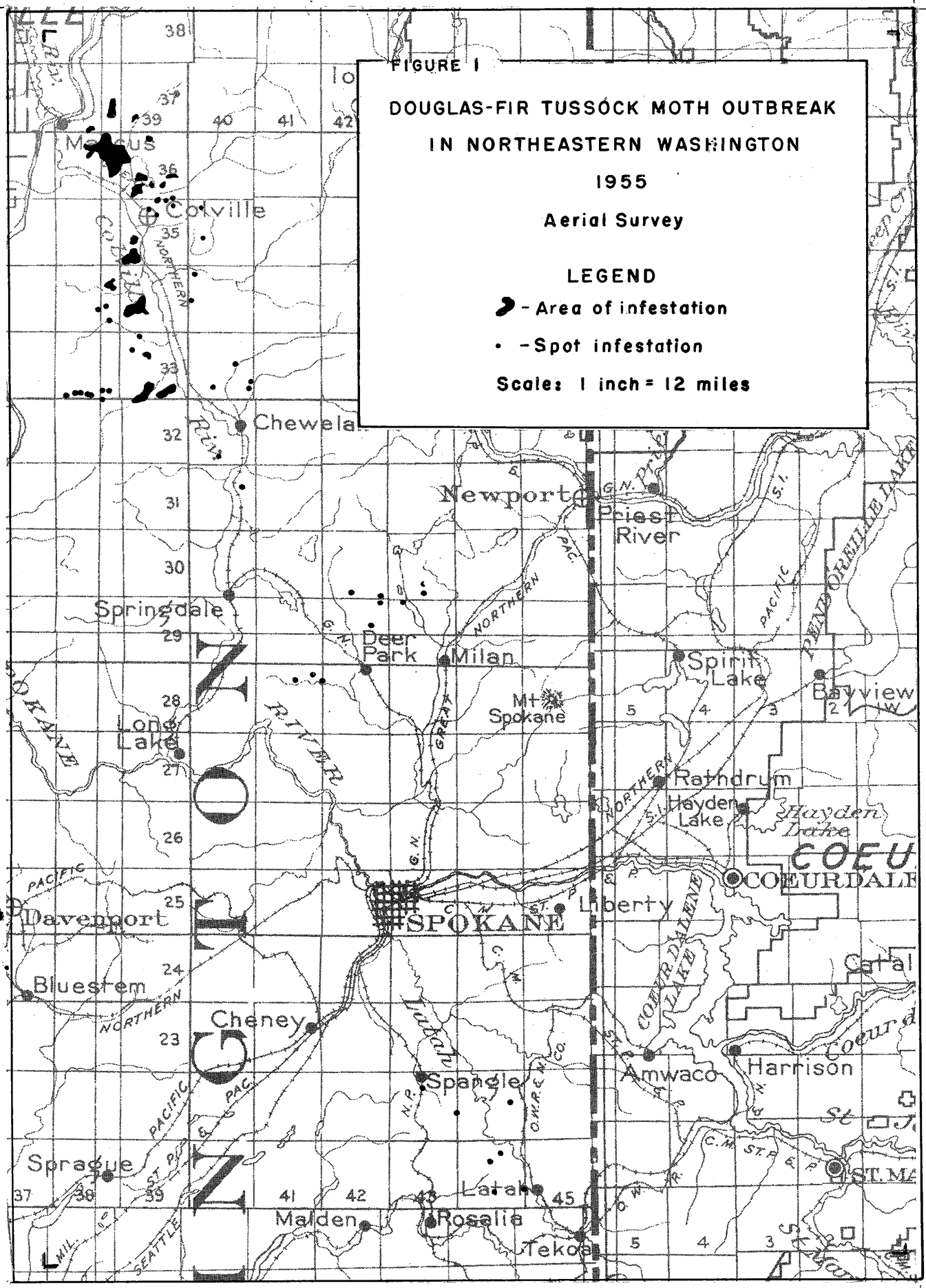
FIGURE 1
DOUGLAS-FIR TUSSOCK MOTH OUTBREAK
IN NORTHEASTERN WASHINGTON
1955
Aerial Survey
LEGEND
- Area of infestation
- Spot infestation
Scale: 1 inch = 12 miles
Colville
Chewelah
Newport
Priest River
Springdale
Deer Park
Milan
Spirit Lake
Bayview
Mt. Spokane
Long Lake
Rathdrum
Hayden Lake
Hayden Lake
COEUR D'ALENE
COEURDALE
Liberty
SPOKANE
Davenport
Bluestem
Cheney
Amwaco
Harrison
Spangle
Sprague
Latah
Malden
Rosalia
Tekoa
PEND OREILLE LAKE
COEUR D'ALENE LAKE
SPOKANE RIVER
NORTHERN PACIFIC
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SEATTLE, LAKE SHORE & EASTERN
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